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Abstract

This study investigates the financial effects of additions to and deletions from the most well-known social stock index: the MSCI KLD 400. Our study makes use of the unique setting that index reconstitution provides and allows us to bypass possible issues of endogeneity that commonly plague empirical studies of the link between corporate social and financial performance. By examining not only short-term returns but also trading activity, earnings per share and long-term performance of stocks that are involved in these events, we bring forward evidence of a 'social index effect' where unethical transgressions are penalized more heavily than responsibility is rewarded. We find that the addition of a stock to the index does not lead to material changes in its market price, whereas deletions are accompanied by negative cumulative abnormal returns. Trading volumes for deleted stocks are significantly increased on the event

date, while the operational performance of the respective firms deteriorates after their deletion from the social index.

Keywords

Corporate social performance, Corporate social responsibility, CSP, CSR, MSCI KLD 400 Index, Social index, Socially responsible investment, SRI

JEL Classification

G14, G32, M14

Abbreviations

AAR	Average abnormal return
CAAR	Cumulative average abnormal return
CFP	Corporate financial performance
CSP	Corporate social performance
CSR	Corporate social responsibility
ETF	Exchange traded fund
ESG	Environmental, social, governmental
SRI	Socially responsible investment

Introduction

Corporate social responsibility (CSR), corporate social performance (CSP), sustainable business and corporate citizenship have become important concepts that have attracted the interest of academics, practitioners and policymakers alike. A very diverse set of issues revolving around CSR has been investigated, ranging from the role of innovation on the link between corporate strategy and social issues (Pavelin and Porter, 2008) and the relationship between CSR and political beliefs (Rubin, 2008) to the necessary contingencies required for building a strong reputation through CSR (Hillenbrand et al., 2012) and even the linkages of CSR with corruption in the case of multinational enterprises (Rodriguez et al., 2006). The theme that has been most extensively examined within this area has been the empirical relationship between CSP and corporate financial performance (CFP). Both qualitative overviews of the literature (Margolis and Walsh, 2003; Renneboog et al., 2008) and statistical meta-analyses (Orlitzky et al., 2003) are indicative of the methodological breadth and diversity of existing studies. They also indicate that no clear consensus with regard to the sign, size and strength between the two concepts has been established (Griffin and Mahon, 1997; Margolis et al., 2009) and stress the need to explore finer-grained characteristics of the CSP–CFP link.

It is in this area that the current study aims to fill some of the existing knowledge gaps, by concentrating on the effects of additions to and deletions from social stock indices. Overall, the fact that we look into short-term and long-term abnormal returns, trading volumes and earnings per share changes connected to social index recompositions, allows us to enrich the literature. Specifically, we show that there is a 'gold social seal' that cannot be explained by traditional views concerning the index effect, but that is in line with predictions coming from the CSR literature. Interestingly, we find that deletions from the MSCI KLD social index are connected with significant negative short-run and long-run returns and increases in trading volumes, whereas there is no analogous result for additions to the index. We anticipate that our findings are of considerable

interest to firm managers, who are trying to create the optimal mix of corporate social frameworks, programs and practices for their firms. The main lesson to be learned is that building strong strategic relationships with key stakeholder groups can backfire, if the firm does not intend to sustain these relationships over time. In addition, corporate executives will be interested to know that the impact of socially beneficial firm policies may be more than outweighed (in terms of financial impact) by indications of corporate social concerns and involvement with controversial industries. Lastly, our research is of relevance to the managers of socially responsible investment (SRI) [1] tracker funds who are desirous of knowing the optimal time to buy newly included stocks and sell newly deleted stocks in order to trade off tracking error (which is usually minimized by transacting immediately before the composition change) and adverse price movements (which are usually minimized by trading immediately upon announcement).

We argue that the setting of these market-related, highly visible events offers considerable advantages over alternative ways to capture the association between CSP and CFP, especially in regards to two problematic issues the literature commonly faces:

(1) The conceptual and empirical distinction between positive and negative CSP indicators (and their respective financial impacts)

(2) The clear separation between CSP and its financial repercussions (i.e. endogeneity between the operationalization of the two concepts)

We elaborate on each of these issues, and how the paper addresses them, in turn. A number of studies have argued that the link between social/environmental and financial performance can be very different across social issues, according to the nature of the issues themselves, the related initiatives and the stakeholder groups with which they are connected (Gilley et al., 2000; Hillman and Keim, 2001; Pava and Krausz, 1996; Rowley and Berman, 2000). Most notably, a stylized observation that has surfaced in the literature has to do with the differences in the financial impacts of CSR versus those of social irresponsibility. Mattingly and Berman (2006) have argued and

demonstrated that a firm's social strengths and its track-record of its respective social controversies are issues that are both conceptually and empirically distinct, should not be combined for research purposes and are likely to generate different economic outcomes. Lankoski (2009) administers a survey addressed to senior executives, which is demonstrative of their view that the damaging financial effects of social actions producing negative externalities are stronger than the value-enhancing outcomes of positive social corporate initiatives. In a similar vein, Folkes and Kamins (1999) find that unethical behaviour in hiring practices had a more significant impact on consumer perceptions than did pro-social activity in employee relations. Mishra and Modi (2013) find that both social responsibility and social irresponsibility are connected with idiosyncratic firm risk (in a negative and positive manner respectively) but that the effects of positive CSP are not guaranteed and are contingent on firm leverage.

All the aforementioned evidence suggests that indications of negative CSP have more powerful financial impacts compared to positive CSP. The setting of this study is such that it provides a natural laboratory for effectively focusing on the distinctive (and potentially asymmetric) financial impacts of positive versus negative CSP and avoid the hazards of endogeneity between CSP and CFP. Given that inclusions of firms to social indices are connected to significant relative improvements of their socially responsible practises and deletions from such indices are related to a deterioration of the firms' socio-environmental status, studying financial returns around these events is an alternative but very intuitive way to examine the differences in the economic impacts of social responsibility and irresponsibility. The neat separation between the two can be instrumental in guiding the decision making process of firm executives that want to implement a corporate strategy leading to effective stakeholder management (through CSR) and portfolio managers seeking to generate positive alphas and reduce significant exposures to idiosyncratic risks (connected to corporate social irresponsibility).

Another issue in the CSP–CFP literature that has received more attention in the last few years has to do with the potential endogeneity characterizing this link. Waddock and Graves (1997) were amongst the first to note that there may be a 'virtuous cycle' characterizing the relationship between the two concepts, whereby higher CSP generates improved financial performance, and improved financial performances boosts higher investment towards socially responsible practices, leading to a simultaneous determination of the size of both. Nelling and Webb (2009), under the same rationale, show that the CSP–CFP link weakens significantly when using appropriate econometric techniques that account for endogeneity. Chang et al. (2013), on the other hand, use regressions with lagged explanatory variables and an instrumental variables approach to bypass endogeneity issues and show that the connection of CSP with firm financial performance and risk survives these considerations.

We posit that examining market reactions to social index recompositions provides a pathway which helps this study escape (or at least alleviate) the concern of endogeneity between social and financial variables that the CSP–CFP literature commonly faces. The very particular sequence that is followed in this type of event (with changes in CSP clearly preceding the index reconstitution and the stock price reactions following the event) provides a unique opportunity to look into a phenomenon that can only be unidirectional (with causality running from CSP to CFP). This is in contrast to, for example, linking social ratings or reputational indices with financial performance because the dynamic evolution of the former can be hard to disentangle from the simultaneous development of the latter (thus making it hard to establish cause and effect).

In summary, this study focuses on one aspect of the CSP–CFP relationship which has not been studied in depth within the relevant literature, despite the fact that it has a direct association with the market's reaction to CSP information and is highly relevant to investor perceptions of CSP itself: the 'social index effect'. This is the price response that the announcement of an addition to or deletion from an SRI equity index causes to the underlying stock. Investigating these

phenomena provides a unique opportunity for unveiling some of the finer characteristics of the relationship between CSP and CFP. By examining inclusions to and removals from SRI stock indices, which are highly visible public events, we can zoom in on the magnitude of the market impact of third-party endorsements of firms' social performance.

Related literature and candidate frameworks

Social indices and reconstitution effects

Interest in research of the link between CSP and CFP has increased in parallel with financial markets' awareness of CSP, as a potentially important factor that can influence risk-adjusted returns of financial assets. Thus, SRI has also become more widespread. This is reflected in the constantly increasing number of SRI funds and the total assets under management which, in the US, have grown from 55 and $12 billion (in 1995) to 493 and $569 billion (in 2010) respectively, in a matter of 15 years. Equally impressive is the fact that, although the number of funds in the hands of professional asset managers significantly decreased during the period of the most recent financial crisis (2007–2010), the funds related to SRI have remained flat − thus the market share of SRI effectively increased. [2]

The rapid development of socially responsible investing into a significant and widely applied investment approach over the past two decades has motivated the construction of a great range of social indices[3] (comprised of socially responsible stocks) and of social tracker funds[4] that aim to replicate the performance of these indices. The performance characteristics and composition of socially responsible indices has been studied and compared to 'conventional' equity indices (Schröder, 2007; Statman, 2006), the general consensus being that, on average, the two sets of indices have similar risk-return characteristics and highly correlated return patterns which, at times, also exhibit substantial dispersion.

Yet, the studies examining whether a socially responsible index effect exists are limited in both number and scope. Although the literature on the index effect relating to mainstream indices is

large, it is not clear whether the key findings therein also apply to socially responsible indices, which are typically both smaller in terms of assets following them and more specialized. It is perhaps also the case that investors may be more challenged in anticipating the future composition of social indices. This is expected because of the additional criteria that the firm must meet in order to be deemed socially responsible and enter the index, on top of meeting the other conditions of listing (based usually on firm size and representativeness of the sector in which the firm operates). Until recently, corporate reports on social responsibility and sustainability were a rarity for the majority of firms and there were no clear guidelines to help structure such reports and ensure the relevance and quality of the information included in them. In addition, companies may selectively provide CSP-related information for self-serving reasons in what has been termed "impression management" (Margolis and Walsh, 2003) making CSP assessment more problematic. Even if the information is reliable, the effort to assess firm social performance may be demanding if most of the available data are qualitative in nature and thus harder to operationalize (Lackmann et al., 2012). The creation of quantitative CSP ratings and scores by specialized agencies has lessened these concerns, but has posed different challenges. For example, in the case of the KLD STATS database (now owned by MSCI and used as part of the screening required for participation to the MSCI KLD 400), there are two main considerations:

(1) The produced CSP ratings are only available to dedicated subscribers and are not widely accessible by market participants, so not every investor can use them to predict index recompositions.

(2) KLD data cover multiple CSP dimensions (community relations, environmental issues, employee health and safety, diversity, human rights, corporate governance, involvement with controversial industries, etc.) and assess social strengths and concerns separately. Thus, it is not straightforward to construct a single numeric measure that encapsulates all the above and use it to predict changes to the constituents of a social index.

To our knowledge, at the time of writing, the extant literature numbers a very small number of studies. Here, we discuss the more characteristic ones. Becchetti et al. (2009) employ the Domini 400 (now MSCI KLD 400 social index) for their analysis and find that stock deletions from the index produce negative short-term cumulative abnormal returns between 2% and 3% while no robust, statistically significant link can be detected when looking at additions to the index. These findings are echoed by Doh et al. (2010), who examine short-term reconstitution effects for the Calvert index and find that, while additions do not incite positive market reactions, deletions lead to a significant average decline in equity prices of more than 1.5%. Ramchander et al. (2012) also focus on the short-term recomposition effects of the MSCI KLD 400 but have a different point of emphasis. Their most original finding is that during index inclusion events, the new members of the index demonstrate modest but statistically significant abnormal market performance, whereas competing firms realize abnormal returns of similar magnitude but opposite sign. They attribute these results to a signalling effect that indicates that the added firm has gained a competitive advantage over its rivals by successfully managing its strategic relationships with key stakeholders (through the application of CSR principles and practices). Another study that is thematically related to ours comes from Lackmann et al. (2012). Unlike the previously mentioned papers, which focus on US social indices, this study focuses on recompositions of the DJSJ STOXX, a sustainability index whose constituents are stocks of leading, socially responsible European firms. The authors bring forward interesting evidence that suggests that inclusion in the DJSJ STOXX increases the reliability of the social responsibility information of the added firm and that this benefit (captured by short-term abnormal returns) varies according to, inter alia, various aspects of firm risk and economic uncertainty.

It is clear from the paucity of evidence that much work remains to be done on socially responsible indices – in particular, in order to construct an over-arching analysis. Since all of the above-mentioned studies only examine abnormal returns over short horizons around the events and do not consider other aspects of trading activity and performance[5], it is challenging to postulate with

a reasonable degree of reliability if these abnormal returns can be explained by traditional financial explanations or if the case of social indices produces a unique kind of index effect. This study advances the emergent literature by providing more comprehensive evidence on the way in which stock performance is affected by the firm being added to or removed from a social stock index. By examining not only abnormal returns, but also trading volumes, and earnings per share in the short-run and the long-run, we shed light on the theoretical explanations for social index reconstitution effects that are observed. In addition, we make use of datasets which cover more extensive periods of time, compared to previous studies, a fact that adds to both the robustness and practical relevance of our work. Finally, we control for various other firm and time-specific variables to identify potential determinants of the related financial effects.

Previous findings from the index effect literature

The index effect, or the tendency for addition to or removal from a stock market index to cause changes in the prices or trading volumes of the underlying stocks, has been well documented for the stock market as a whole. The literature that investigates the index effect has grown simultaneously with the number and importance of index funds, institutional and individual investors who resolve to passive investing and index arbitrageurs. The advent of passive strategies and the perception that active managers do not beat the market led to the creation of the first index funds back in the 1970s. Today, these funds have evolved into more liquid forms, usually referred to as exchange-traded vehicles, the objective of which is to follow a particular benchmark. Institutions and private investors are more interested in indexing than ever before, because it offers lower management fees with negligible tracking errors.

The addition to (or deletion from) the index may be triggered by the firm meeting (or not meeting anymore) the relevant inclusion criteria or by a variety of different corporate events (delisting, bankruptcy, takeover and others). An important dimension that contributes to the magnitude of the index effect is the way that index recompositions are announced in the market and

consequently, the level of anticipation of the relevant changes. Despite the efficient market hypothesis (Fama, 1970) predicting that index recompositions should not have any effect on stock prices[6], significant price and volume changes connected to such events (mainly for the S&P 500 index) have been observed in numerous studies. Consequently, a number of other conjectures have emerged in efforts to explain these results. These frameworks can be distinguished from one another according to whether the effects on company stock price and volume performance are temporary or permanent, the new information component that, arguably, comes along with each announcement of addition or deletion, and the investor behaviour after the event.

The price pressure conjecture supports temporary price and volume effects for stocks involved in index recompositions due to short-term increases in demand (/supply) for firms added to (/deleted from) the index by tracker funds. Harris and Gurel (1986) reported a significant price increase of 3.13% on the date of an S&P 500 inclusion, which was almost fully reversed after two weeks. Woolridge and Ghosh (1986) provided similar evidence by finding a 2.77% price increase, while Arnott and Vincent (1986) reported a 2.91% price increase on the date of addition and a 1.44% price drop on the date of deletion.

The second framework relies on the imperfect substitutes assumption that differentiates index member firms from non-member firms and contradicts the Scholes argument (1972) that stocks are not "unique works of art" and their demand curves are kept flat by arbitrage between perfect substitutes. According to this conjecture, prices will change to eliminate any excess demand or supply in the market with no reversal, while trading activity will change temporarily until the new level of equilibrium is reached. Shleifer (1986), Wurgler and Zhuravskaya (2002) and Morck and Yang (2002) examined the index effect and brought evidence in favour of this rationale. Tests for the imperfect substitutes conjecture regard index recomposition events as information-free. However, in 2003, Denis et al. proved that inclusion in the index was consistent with significant increases in earnings per share forecasts and significant improvements in realized earnings. Their

results were in favour of the third theory that refers to the assumption of new information content. According to this view, index recompositions are not information-free events, therefore the price effects on firm performance after the event period should be permanent. Later studies by Dhillon and Johnson (1991) and Cai (2007) were also in favor of the information content view.

The fourth possible explanation relies on liquidity effects, which are mainly attributed to the increase of index funds. Specifically, inclusion in an index is an event that promises a permanent increase in the stock's liquidity and therefore, prices and trading volumes shall both increase permanently to reflect this new advantage of the included stock. Edmister et al. (1996) were the first supporters of this view, finding permanent price effects after inclusion that did not reverse over time. More recently, Baran and King (2012) find that liquidity improves for added firms and declines for removed firms and that these changes can help explain the respective decrease and increase in the cost of equity of these firms.

The last way to explain the index effect relies on Merton's theory (1987) about market segmentation and investor recognition. According to this view, investors are aware of only a subset of the universe of available stocks. Thus, it can be argued that they only know of and are willing to invest in the stocks that are constituents of the index under investigation and that they require a lower return for holding these stocks. Chen et al. (2004) were the first to argue that inclusion in an index increases the overall investor awareness of the particular asset. As the stock becomes part of their portfolio universe, it is subject to stronger buying pressures and its required rate of return is permanently reduced. Since investors cannot be made unaware of a deleted stock, the price effects will not be symmetrically negative in the case of deletions from the index. It should be noted that much of the empirical literature supporting these theories has focused on the S&P 500. Consequently, the wider applicability of these frameworks to all indices can be debated − which is what this study is doing in the case of the MSCI KLD 400. There have only been occasional instances of studies that focus on other indices and provide support for some of the previously

mentioned theories (Biktimirov et al., 2004; Madhavan, 2003) that investigate the reconstitution effects of the Russell 2000 index.

To sum up, the five alternative explanations that have been put forward to explain the traditional index effect are distinguishable in the existing literature according to whether the effects of recompositions are permanent or temporary with regard to stock prices and trading volumes. Table 1 serves as a concise illustration of the characteristics that are consistent with each theoretical framework.

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It is not, however, clear that any of these explanations − mainly explored in the framework of the S&P 500 − would apply to social indices. For example, Standard and Poor's base their decisions concerning the S&P 500 index composition on market capitalization, industry representation and corporate events (bankruptcy, decision to go private, etc.) whereas in the case of the MSCI KLD 400, environmental, social and governance (ESG) criteria are an explicit part of the recomposition process. Thus, it is reasonable to posit that while reconstitutions to S&P 500 may be information-free events, the respective events in social indices are informationally meaningful.

To be more specific, we anticipate that in the case of social indices, recomposition events may produce strong signalling effects concerning a firm's level of corporate social performance and consequently its future financial performance, since the two concepts are related. We posit that the institutional seal of social responsibility that comes with the recomposition of social indices may not be treated as an information-free event; therefore, the information content explanation is likely to better explain any price and volume effects. Furthermore, although there might be asymmetries in the performance between added and deleted firms in the case of the social indices, these do not necessarily conform to the recognition view, since the nature of information revealed

in the market is likely to undermine the shadow cost theory and impact the deleted firms at a higher degree than the added firms. In summary, we postulate that social index recompositions are information-rich events and expect that they are associated with significant financial impacts, especially in the case of deletions, and that this unique 'social index effect' cannot be fully explained by the conventional index effect frameworks outlined above.

Conceptual framework

The generic literature that studies the index effect has put forward numerous conjectures in order to explain the price and trading volume changes of stocks that are added to or removed from the index of interest. In addition, the extensive work that has been conducted on the empirical relationship between corporate social responsibility and firm financial performance has revealed a series of stylized facts that characterize this link. Since this study falls in the cross-section of the two strands of financial research, we attempt to highlight certain aspects of the CSP–CFP link that may somewhat differentiate the observed social index effect from the respective index effect of conventional stock indices.

The first observation we would like to make stems from the fact that corporate social performance is, admittedly, very hard to quantify. A wide range of measures have been employed to capture CSP. These include the amount of charitable contributions firms make, the lines of prose dedicated to CSP in corporate disclosures, surveys, lists and third-party social audits concerning the firms with the best reputation (in terms of their business practices) and their inclusion in social indices[7]. Due to the conceptual complexity that comes with CSR − along with the subjectivity and practical difficulties that can arise when attempting to measure it − stakeholders and investors interested in SRI are more likely to accept a firm's CSR reputation as legitimate when it comes through third-party institutional endorsement (Doh et al., 2010). Such a 'social seal' can be acquired in three ways:

(1) A firm's participation in a list that is relevant to CSR (Fortune's Best Companies to Work For, for example).

(2) The ratings produced by the audits conducted by social ratings agencies and departments (the MSCI KLD database has been one of the most widely used in this respect).

(3) Addition to a well-known social index with clearly established social criteria.

Although each of the above has its merits and there is validity in using any of them to infer a firm's CSR, reputation lists have been shown to be influenced by financial performance to a significant extent (Brown and Perry, 1994), while the results of third-party audits are not publicly available and the market's reaction to them cannot be accurately pinpointed around a specific date. Thus, we argue that additions to and deletions from well-established social indices can provide market participants with a strong and clear public signal concerning the social performance of the relevant firms. This signal has the potential to significantly influence the demand for these stocks (through individual and institutional investors) and corroborate the demand generated by exchange traded funds (ETFs). Although social indices refer to a narrower part of the market compared to some of the conventional indices where index effects have been observed (S&P 500 being the most obvious case), there are still ample reasons to assume that such effects will also exist in their case.

A second issue has to do with the potential asymmetric impact of additions and deletions on abnormal stock returns. The index effect literature has provided empirical results which substantiate either (1) the existence of a qualitatively symmetric impact where additions to the index lead to positive abnormal returns, and deletions from the index lead to negative abnormal returns (Arnott and Vincent, 1986; Lamoureux and Wansley, 1987) or (2) the existence of an asymmetric impact where additions to the index lead to statistically significant positive abnormal returns, but the abnormal returns related to deletions are less pronounced (Chen et al., 2004).

However, when looking at social indices there is also the possibility that there is an asymmetric effect of the exact opposite nature (non-significant abnormal performance for additions, negative

returns for deletions). This is based on empirical evidence suggesting that corporate social responsibility and corporate social irresponsibility affect a firm's financial performance to differing magnitudes. Wood and Jones (1995) observe that event studies making use of market-based measures of CFP reveal a trend for poor social performance to cause financial harm but do not provide evidence of financial benefits accruing from strong social performance. In addition, Meijer and Schuyt (2005) find that while consumers will boycott a firm if its CSP falls below some minimum threshold, high levels of social responsibility do not appear to increase product sales. On a more general level, it has been documented that "the economic impacts [of CSP] are more positive for issues reducing negative externalities than for issues generating positive externalities" (Lankoski, 2009, p. 218). More recently, Mishina et al. (2012) use social judgement theory to discuss in detail how conflicting indications of social responsibility and irresponsibility can shape stakeholders' judgement of corporate character. Using the concept of 'cue diagnosticity', they argue that even in the presence of positive CSP indicators, negative CSP indicators can be more greatly influential on perceptions of a firm's true corporate character and subsequently to its economic bottom line.

Taking all the above studies into consideration, we posit that if the signal generated by a stock's deletion from a social index is taken to mean not merely that the firm is less responsible than it was before, but rather that it has been found to be involved in certain socially or environmentally controversial issues, then the financial impact can be theorized to be greater than that of an addition to the index. Furthermore, we argue that the potential asymmetry in favour of more powerful financial impacts in the case of negative CSP indicators can be more easily observed in financial markets in the case of social index reconstitutions compared to changes in social ratings. We believe this to be the case mainly due to the high visibility of the social index recomposition events (especially compared to and contrasted with corporate ESG ratings that are usually only available to subscribers) and the immediacy by which they guide investment decisions made by tracker funds. In addition, the simple, binary nature of the index recomposition events (a firm is

either in or out of the index) makes the cognitive assessment of the phenomenon on the part of investors easier, compared to aggregating multidimensional CSP ratings and accordingly deducing whether a firm has become more or less socially conscious compared to each previous history and its peers.

Lastly, we argue that by studying the social index effect we can avoid the alleged endogeneity problems and simultaneity bias that may arise due to the bidirectional causality between CSP and CFP (Waddock and Graves, 1997). The phenomenon of interest takes place in three discrete steps:

(1) The firm changes its posture towards society and the environment and materializes this change through its operations and interactions with stakeholders.

(2) Then, the committee or organization which is responsible for the composition of the index decides that the firm should be included to or removed from the index.

(3) Finally, the market responds to the announcement of the decision of the committee.[8]

Because of this particular sequence, there appears to be a clear path that leads from social performance to index participation and the corresponding market performance (separated in distinct stages), and there is no obvious mechanism that suggests an inverse contemporaneous relationship that runs from financial returns to CSP. It should be noted that the rationale behind this argument could be extended to other types of CSP-related events occurring in discrete points in time and whose financial effects could also be explored through the application of event study methodologies. Although the empirical CSP–CFP literature has mostly utilized regression analysis to establish a link between the two concepts, there are a few papers that follow this alternative methodological route. Godfrey et al. (2009) use an event study framework and document the insurance-like financial effects of CSR on announcements of regulatory sanctions on firms. In a similar fashion, Chollet and Cellier (2011) also conduct an event study in order to zoom in on the short-term market effects of social ratings announcements in Europe. We follow these topical

studies, as well as a variety of work from the mainstream finance literature, to guide the empirical methodology of this paper. We provide the respective details in the following section.

Data and methodology

The MSCI KLD 400 social index

In order to conduct our analysis, we employ one of the oldest, most well-known and most frequently referenced US indices, the constituents of which include stocks of firms that conform to criteria of social responsibility and are available to ESG investors for benchmarking. This is the MSCI KLD 400 social index. Some additional clarifications concerning the inception, investment universe, non-ESG considerations, index reviews, the number of constituents and the relevant announcements for the index are warranted at this point. The MSCI KLD 400 index (formerly known as the Domini 400 social index or FTSE KLD 400 Social index) was launched by KLD Research and Analytics Inc. in 1990. Since then, the acquisition of KLD by RiskMetrics and the subsequent acquisition of RiskMetrics by MSCI in June 2010 has led to the latter managing the index.

MSCI KLD 400 consists of 400 companies with the underlying investment universe being the MSCI USA Investable Market Index (IMI). MSCI seeks to maintain a sector representation for the index with weights similar to that of MSCI USA IMI. Firms involved in any of the following sectors are not included in the investment universe: Alcohol, Gambling, Tobacco, Military Weapons, Civilian Firearms, Nuclear Power and, more recently, Adult Entertainment, and Genetically Modified Organisms. MSCI also applies a series of stringent criteria with regard to, inter alia, the firm's:

- management of its impact on the local communities in which it operates
- handling of human rights issues
- commitment to charity and philanthropic activities

- commitment to employee safety and respect of diversity issues and labour rights
- management of environmental challenges and reduction of hazardous outputs
- standards in regards to product safety and quality
- concern for corporate governance issues, the natural environment, its employees, human right issues and its involvement in controversial industries[9]

There is also a size-segment representation with MSCI targeting to include a minimum count of 200 large and mid-cap constituents. Recompositions of the index take place on a quarterly basis and the changes are implemented at the end of the month in which the review is held. According to the current index policy, although deletions from the index (especially those caused by corporate events) may occur between index reviews, no additions to replace those firms will be made until the next scheduled index review. This effectively means that for a period of time the index may consist of less than 400 firms[10]. In the years before 2011 (where the entirety of the sample of our study lies), recomposition announcements went to institutional/individual licensees and to the general public. This was initially done by a press release and later the announcements were posted online. Hence, addition and deletion announcements were readily observable by all market participants.

In summary, MSCI KLD 400 constituents are deleted if they are deleted from the MSCI USA IMI Index (this includes delistings, mergers, bankruptcies and other corporate events), if they start being involved in one of the controversial industries previously outlined or if they have significantly deteriorating CSP performance. Additions to the MSCI KLD 400 Social Index are made to restore the number of index constituents to 400. Companies are added to the index based on criteria regarding CSP performance, sector alignment and size representation. The MSCI KLD 400 index is tracked by the MSCI KLD 400 Social Index Fund, which is an ETF of the iShares

family (Blackrock) with a market cap of around $175 million. It runs on expense ratios ranging between 70 and 90 basis points.[11]

Sample construction and calculation of abnormal returns

MSCI has provided us with the lists of additions and deletions from the MSCI KLD 400 index respectively from inception until October of 2011. For the MSCI KLD 400 index, the earliest date for either an addition or deletion event is May 31, 1990 and the latest is July 14, 2010.

The initial samples are not completely free of any bias that could lead to erroneous statistical inferences. In particular, these samples may include firms that are in financial distress and are likely to go bankrupt or become takeover targets at about the same time that they are deleted from the index. Naturally, such evolutions constitute confounding events and it is impossible to disentangle their influence on stock prices from that of the deletion events. The renaming of a firm on the other hand, is sufficient to lead to its deletion from the index (and its addition under its new name) but should generate only a very modest, if any, market response[12]. Thus, we exclude all firms for which their addition or deletion from the index is related to a merger, acquisition, spin-off, bankruptcy, suspension, deletion of trading or similar corporate events.

Additionally, in order to ensure the robustness of our estimates, and to avoid thin trading issues, we impose a set of criteria for a firm to be included in our final sample. Specifically, we require: that there are no missing values in the time-series of the firm's stock price for the period starting 15 trading days before the event and ending 10 trading days after it; that there are no more than 25 missing values in aggregate for the next 375 days (approximately one and a half years); that the average trading volume is greater than 100,000 shares over a period of one year before the event; and that, in order to avoid the effects of extreme values on our results, we do not include any firm-day observations with an average abnormal return (AAR) of absolute value 20% or more. This last criterion leads to a small dynamic variability in the overall number of firms that are used in the calculation of daily AARs[13]. The requirements (along with data availability of prices, trading

volumes, earnings per share and market values for each firm, obtained by Thomson Reuters Datastream) lead to final samples of approximately 201 additions and 77 deletions for the MSCI KLD 400 index.

In our analyses, we employ daily returns calculated on a closing price basis, adjusted for dividends. Daily observations are consistent with the method used by previous research and due to the large sample size, the problem of non-normality for daily data (Brown and Warner, 1985) is not an issue. Previous studies on index effect have employed a multitude of different methods for calculating abnormal returns with regards to the duration of the event window of interest. The most frequent choice amongst them is the market model; a parsimonious one-factor model that adjusts returns according to the level of the stock's systematic risk. Although more complex models have also been used to account for additional factors that may be important determinants of stock returns (Fama and French, 1992; Carhart, 1997), it has been noted that: *In practice the gains from employing multifactor models for event studies are limited. The reason for this is that the marginal explanatory power of additional factors beyond the market factor is small, and hence there is little reduction in the variance of the abnormal return.* (Campbell et al., 1997)

Thus we elect to employ the market model in this study. In order to estimate the model parameters, we use a post-event period to count for potential selection criteria effects. Jain (1987) and Edmister et al. (1996) claim that the parameter estimates calculated using a pre-event estimation period will be biased, since it is highly probable that the firms of interest have performed well before their inclusion in the index. In fact, it may be exactly this strong performance that eventually led to their inclusion in the index. Copeland and Mayers (1982) have used a post-inclusion estimation period to confront the selection bias in their study for measuring the abnormal performance observed from the announcement of stock rankings of Value Line Investments. Concerning event studies for S&P 500 index changes, Denis et al. (2003) also used a post-inclusion estimation period.

The linear specification of the market model for any security *i* at time *t* is:

$$R_{it} = a_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where R_{it} and R_{mt} are the period-t returns on security i and the market portfolio a_i is the return when the market portfolio returns are zero, β_i is the sensitivity to each source of risk, and ε_{it} is the zero-mean disturbance term, respectively. We use S&P 500 as a proxy for the market portfolio. S&P 500 is the most closely followed US stock index and is widely considered to be representative of the US economy as a whole, having approximately 75% coverage of US equities.[14] Model coefficients are estimated from a period of 250 trading days, starting 126 days after the event and ending 375 days after the event. We chose this period as we also require a lengthy observation window (which starts 10 days before the event and ends on 125 days after the event) that does not overlap with the estimation window for the purposes of investigating long-term stock performance. The illustration of the event windows is shown in Figure 1, where T is the event date.

INSERT FIGURE 1 ABOUT HERE

The abnormal return for each stock will thus be given by:

$$AR_{it} = R_{it} - \hat{a}_i - \hat{\beta}_i R_{mt} \quad (2)$$

The next step is for the abnormal returns calculated for every stock to be averaged against the total number of announcements N for each day of the event window of interest:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad (3)$$

Lastly, these average abnormal returns can be summed over the entirety of the event window (from day 1 to day *T*) in order for the cumulative average abnormal returns (CAARs) to be calculated:

$$CAAR_{1,T} = \sum_{i=1}^{T} AAR_t \tag{4}$$

To test the statistical significance of the AARs and CAARs, two-tail *t*-tests are performed that are defined as follows. For testing AARs:

$$t - stat = \frac{AAR_t}{\hat{S}(AAR_t)} \tag{5}$$

where AAR_t is the average abnormal return at time *t* and $\hat{S}(AAR_t)$ is the standard deviation of the average abnormal returns over the estimation period, given by the following formula:

$$\hat{S}(AAR_t) = \sqrt{\frac{1}{T'}\sum_{t=1}^{T'}(AAR_t - \overline{AAR_t})^2} \tag{6}$$

For testing CAARs:

$$t - stat = \frac{CAAR_{1,T}}{\hat{S}(AAR_t)\sqrt{n}} \tag{7}$$

where $CAAR_{1,T}$ is the cumulative average abnormal stock return from day 1 to *T* and *n* is the number of days between 1 and *T*. The null hypothesis is that the AARs and CAARs should be zero.

Abnormal trading volume

We examine volume data before and after the event period. If events are anticipated, significantly increased trading activity should be expected before the index recomposition event takes place. Volume data can give information about the timing of purchases caused by index funds and other institutional investors, as well as the demand that may have been caused by arbitrageurs.

Abnormal volume performance is estimated using volume ratios, a method also employed by Harris and Gurel (1986) and Beneish and Whaley (1996). The average relative stock-to-S&P 500 volume ratios are estimated over a period of 12 weeks (60 trading days) before the event period, and considered as the base volume for each added stock. The 60-day period starts 120 days before the event and ends 60 days before the event in order to avoid biases of inflated volume figures due to potential market anticipation of the index recomposition. They are then compared with the daily stock-to-index ratios observed during and after the event period. The null hypothesis is that the mean volume ratio across all firms for each day *t* of the event period should equal one. If the null is not rejected, then there is no significant abnormal volume on that day. The formulas for calculating volume ratios are given below:

$$\overline{BVR_i} = \frac{1}{60} \sum_{t=T-120}^{t=T-60} \left(\frac{V_{it}}{V_{mt}}\right) \tag{8}$$

$$VR_{it} = \frac{V_{it}}{V_{mt}} \div \overline{BVR_i} \tag{9}$$

$$MVR_t = \frac{1}{N} \sum_{i=1}^{N} VR_{it} \tag{10}$$

where, the base relative volume ratio BVR_i is the average stock-to-index trading volume in the 12 weeks before the event period, V_{it} and V_{mt} are the trading volume of each stock and the corresponding S&P 500 volume at each day *t* of the event window respectively, MVR_t is the mean

volume ratio across firms at each day *t* of the event window and *N* is the number of firms in the sample.

The significance of volume ratios is measured by the t-mean test defined as follows:

$$t\text{-}mean = \frac{MVR_t}{\text{stdev}(MVR_t)\sqrt{N}} \quad (11)$$

Results

Stock price performance

Table 2 reports the AARs for additions to and deletions from the MSCI KLD 400 index for the period starting 10 days before the recomposition occurs and ending 15 days after it. No particular pattern emerges when looking at the abnormal returns of the additions sample. Their absolute values are quite low, statistically insignificant and their signs change from day to day within the observation window. The picture is clearer when focusing on the AARs of the deletions sample: The only statistically significant result is a negative abnormal return of –0.69%, significant at the 5% level, which occurs on the event date. In addition, the fact that, on the period between the event (T) and up until two trading weeks after it (T+10, inclusive), the majority of observed abnormal returns (8 out of 11) are negative qualitatively corroborates the value-decreasing trend emerging for the stocks of deleted firms.

INSERT TABLE 2 ABOUT HERE

Table 3 reports the CAARs connected to the recomposition events for both short-term and long-term observation windows for the index. Overall, the cumulative performance of firms added to the index is actually negative in the short-term after the event, but this effect is partially counterbalanced by the positive returns that these firms reap shortly before their inclusion (an

observation that could be taken to mean that the market may have a modest ability to predict some of these inclusions a few days before they happen). However, none of these results pass the standard statistical tests. Stocks deleted from the index have CAARs approximately equal to –1.60% for the first three trading weeks after the event, but still, these findings are not statistically significant. What is more impressive is the fact that, six months after the firms have been deleted from the social indices, the CAARs not only remain negative but accumulate further to a total of –14% in the case of the MSCI KLD 400 index (a result which is highly statistically significant at the 0.1% level).

INSERT TABLE 3 ABOUT HERE

In an effort to explore the possible determinants of the financial effects of social index recompositions, we run a series of cross-sectional regressions with the dependent variable iteratively being abnormal returns on the event date, cumulative abnormal returns for the [0,+15] period and cumulative abnormal returns on the [0,+125] period. We do this separately for each type of event. We use market capitalization and the ratio of book-to-market value as key regressors in these analyses as the seminal work of Fama and French (1992) suggests that they are important determinants of cross-sections of stock returns (beta is implicitly included by using the market model in the calculation of abnormal returns). We also include measures of firm profitability (return on equity), leverage (total debt to common equity), research and development intensity (R&D expenditure to total sales) and dividend yield. These variables have all been used as possible determinants of stock returns as well as moderators of the relationship between CSR and financial performance (Edmans, 2011; Oikonomou et al., 2012). We add a binary variable for the exchange where each stock is traded (where 1 is for stocks traded in NASDAQ and 0 is for stocks traded in NYSE), another binary variable that indicates whether the event takes place on the first half of the

history of the respective index (to partially capture dynamics of the investigated effects without significantly reducing available degrees of freedom), and a series of dummies to control for the supersector to which the firm belongs (based on the Industry Classification Benchmark). The results are contained in Tables 4 and 5 for additions and deletions, respectively.

In the case of additions to the MSCI KLD, what stands out is that the longer-term financial effects of added firms are stronger for larger firms, for firms with strong fundamentals but with weaker operational performance and for firms listed in the NASDAQ exchange. On the other hand, for firms deleted from the index, it appears that there is an inverse relationship between the short-term market reaction to the event and the dividend yield policy of the firm. No other characteristic appears to be connected with abnormal financial performance following deletions in the short-run or long-run.

INSERT TABLES 4 AND 5 ABOUT HERE

Although the cross-sectional analysis of possible determinants of the financial performance during and after the recomposition events is not truly revealing, one point that is worth noting is that the overall explanatory power of the utilized set of variables is much higher for deletions (approximately ranging between 36% and 44%) compared to additions (ranging between 14% and 25%). This fact indicates that, although no particular firm characteristic can be consistently identified as an important determinant of the respective abnormal returns, the overall connection between this standard set of firm-/stock-specific factors and financial performance is significantly stronger for deletions compared to additions.

Taking all the above results into consideration, it appears that there are no significant short-term price pressures related to stocks added to the social index. The same cannot be said about deleted firms, as we find negative and significant abnormal returns of –0.69% for MSCI KLD on the event

date. This negative effect accumulates to –1.61% three trading weeks after the event. Given the modest market capitalizations of ETFs of the index (less than $200 million), it appears plausible that there are no material price pressure effects caused by institutional trading activity during recomposition events. On the other hand, there is stronger support for a negative long-term price effect connected to firms being deleted from the index. Not only does the cumulative performance remain negative for several months, but it is also significantly reinforced, reaching –14% approximately six months after the event. This finding of a long-term negative price effect of stocks deleted from MSCI KLD 400 makes us reject the price pressure view in the framework of social indices. Furthermore, the fact that price effects are only apparent in deletions and not additions also goes against the investor recognition framework (where the exact opposite would be expected).

Trading volume performance and effects on earnings per share

Trading during index recomposition announcements

According to previous findings, there are two main parties that are involved in trading index recompositions. The first one represents index fund managers, the mandate of which is very specific. Passive trackers will wait until the stock exchange's closing auction on the event date to rebalance their portfolios and avoid tracking errors. Kappou et al. (2010) showed that in the case of the S&P 500, the volume levels on the event date were almost 16 times higher than normal and most trading activity was concentrated towards the last 5 minutes of the trading day, indicating that index fund managers were more concerned with tracking error than with firm performance during the event window. The other party involved in index recompositions represents the arbitrageurs, and in cases where index changes are preannounced, they will trade on the first date after announcement by buying (/selling) the added (/deleted) stock and close out the position on the event date, when index fund managers are entering the market.

In the case of the MSCI KLD 400 index, we anticipate any abnormal trading activity to concentrate on the event date and a few days after. Any abnormal trading before the event could provide evidence of anticipation of the index changes by analysts, who follow the relevant stocks and who closely monitor the rankings of socially responsible companies.

The effects of social index recompositions on trading volume

Table 6 shows the volume ratios for both added and deleted firms for the same observation period as discussed above. Although the figures for the period before the event are not significant in the case of additions, the stocks of deleted firms are characterized by increased trading activity throughout the one-week period before the event date, providing evidence of anticipation of the coming event. On the event date, the average volume ratio of the added stocks is 1.30 times higher than usual, but is insignificant, whereas the average volume ratio of the deleted stocks is almost twice as high (1.93) as normal and is statistically significant at the 5% level. Both of these numbers are the peaks of the trading volume ratios of the addition and deletion samples in the post-event period. The abnormal volume activity remains significant for a period of almost one week after the event, but only for the deletions sample. This may indicate that the market appears to be concerned more with deletions than additions, when it comes to information connected to changes in the level of corporate social performance of the firms. Accordingly, index fund managers appear more inclined to trade immediately after a firm is deleted from the index. With regards to the long-run performance of the volume ratios, we can see that the trading patterns of added stocks remain relatively stable, whereas for deleted firms, the upward trend reverses and trading volumes decrease after the event dates (Figures 2 and 3). From all the above findings, we conclude that only the deletions sample of the MSCI KLD 400 index experiences significant trading volume effects, which are reversed in the long run. It also seems apparent that the information signal in the case of deletions is strong enough to cause a short-term abnormal trading activity, even in the absence of indexed assets (and potentially arbitrageurs).

INSERT TABLE 6, FIGURE 2 AND 3 ABOUT HERE

Overall, we find temporary volume effects when looking at deletions from social stock indices. The fact that these impacts are not persistent makes us reject the liquidity effect view. In conclusion, we have thus far looked at prices and trading volumes related to recompositions of social stock indices and we have found evidence that there are permanent negative price effects and temporary changes in trading activity only for deleted firms. By comparing these findings with the information contained in Table 1, we find that they are not compatible with the price pressure, liquidity effect and investor recognition explanations and are more consistent with the information content and imperfect substitute theories. It is particularly hard to distinguish these theories, as they predict the same outcomes as far as effects on prices and trading volumes are concerned, and their main difference is whether these effects are information-free or not. In the case of social indices it would be very hard to argue that reconstitutions are information-free events, as they are directly related with publicly conveying material information about the social and environmental posture of firms (see Conceptual framework). So we believe that, according to our findings, the most prevalent index effect view for this type of indices is the information content hypothesis, but with the effects being asymmetric and stronger for deletions. To further test the informational relevance of social index recompositions, we look at firm operational performance in the next subsection.

Index rebalancing and operational performance

The S&P 500 index effect literature provides theories that contradict one another when it comes to the effects of index membership on company performance. Malkiel and Radisich (2001) find no evidence of increase in company valuation after inclusion, by using a discounted cash-flow model that was applied to a sample of index-member and non-index-member firms. Morck and

Yang (2002) on the other hand, provide evidence that index inclusion is associated with significantly higher company valuation, by observing the firm's Tobin 'q' ratio. A recomposition of the MSCI KLD 400 index can provide signals of changes in the level of a corporation's social performance, which may consequently affect the future economic performance of the relevant stocks. Indeed, the majority of the CSP–CFP literature at the firm level suggests that there is a positive connection, although its characteristics are debated (Margolis and Walsh, 2003; Orlitzky et al., 2003). The potential change in a firm's valuation is consistent with the 'information content' assumption, on the basis that the seal of social responsibility represents a certification effect, which could lead to improved financial performance.

We examine firm earnings before and after the event of additions to and deletions from the MSCI KLD 400 index. The variable we employ is earnings per share (EPS) obtained from Thomson Reuters DataStream. The pre-event earnings per share are computed for each firm using a period of one calendar year before the recomposition event (average of earnings over four calendar quartets). Accordingly, the post-event earnings per share are computed for each firm using a period of one calendar year after the event. We do not examine EPS for longer than a year after the recomposition due to potentially confounding effects from firm-specific events other than index membership. An equality of means test is performed to identify whether changes in earnings per share are statistically significant. Table 7 presents the relevant results. In the case of additions, the level of EPS for the index member firms increases by 5.96% (from $1.37 to $1.45) whereas, for deletions, EPS fell by 6.54% (from $2.20 to $2.06).[15]

INSERT TABLE 7 ABOUT HERE

The above results are qualitatively in line with our expectations about the effect of the social (ir)responsibility factor on company performance, although the differences are not statistically

significant. It appears that the detriments of social irresponsibility are mildly more impactful than the benefits that come with the gold seal of social responsibility.

Measurement of changes in corporate social performance surrounding index reconstitution events

In an effort to substantiate our claim that the financial impacts surrounding social index recomposition are indeed driven by changes in CSP, we look into the dynamic evolution of the index constituents' social scores, as recorded in the KLD STATS database. KLD rates firms using multiple CSP indicators within seven 'qualitative issue areas' (community relations, diversity issues, employee programs, environment issues, product safety and quality, corporate governance, and human rights) and also records their involvement in controversial sectors (military contracting, nuclear power, firearms, alcohol, tobacco or gambling). The rating is done separately on strengths and concerns of the same social dimension and is recorded on KLD STATS on an annual basis (though the assessment of CSP is ongoing). We average indications of strengths (/concerns) across all dimensions of CSP for each firm in each year to create annual disaggregated measures of social responsibility (/irresponsibility) and examine how these measures change in the year before, during and after the firm is added or removed from the MSCI KLD 400.

As expected, our findings indicate that, on average, CSP increases for firms added to the index and decreases for those being removed from it. We find that the aggregated strengths score increases for 50 of the firms added to MSCI KLD in the year leading to the addition (it is reduced for 17 and remains the same for the rest), with the average increase being 0.019. The trend continues in the year following the addition, with 39 firms having increased social responsibility (35 decreased and the rest remained as they were) and the average increase being 0.013. Similarly, aggregated indications of social irresponsibility increase for 12 firms in the year leading to their deletion (drop for 8 firms and remain constant for the others) and for 26 firms in the year following their deletion (they reduce for 7 firms and stay the same for the rest). The aggregated scores for social irresponsibility increase by 0.03 on average in this period[16]. Overall, these numbers corroborate

our view that social index recomposition events constitute certifications of corporate social performance, thus making them differently framed phenomena compared to those related to conventional equity indices.

Discussion

Principal findings and reconciliation with other studies

The essence of our findings is that inclusion of a firm in the MSCI KLD 400 social index does not produce economically substantial or statistically significant, short-term or long-term abnormal returns. However, deletion of a stock from the index results, on average, in negative cumulative abnormal returns of approximately –1.60% within 15 trading days after the event. The long-term financial performance of the deleted stocks is also negative, with the firms that are removed from MSCI KLD 400 index experiencing an especially strong, negative performance which accumulates to –14% in a matter of six months after the event. Deletions are also associated with temporary increases in trading volumes and a decrease in ex-post operational performance (although the latter is not statistically significant). Additional analysis reveals increases in CSP for firms being added to the MSCI KLD 400 and a deterioration of social performance for firms being deleted from it. Taking all the above into account, we conclude that there is a distinct 'social index effect' that differs from the financial effects of recompositions in conventional equity indices in that deletions are connected with more significant economic and/or statistical market returns, trading activity and post-event earnings. This principal finding corroborates recent evidence of the CSP–CFP literature, which shows that negative CSP is more strongly related to negative CFP than positive CSP is connected to positive CFP.

Looking at previous studies focusing on social indices in particular, short-term results are in line with the findings of Becchetti et al. (2009) and Doh et al. (2010). Conversely, at first glance, the inferences drawn seem to contradict the results of Ramchander et al. (2012). Ramchander et al. (2012) focus on short-term reconstitution effects for the MSCI KLD 400 and also find modest,

positive cumulative abnormal returns for additions (0.50% for the first three days after addition, significant at the 10% level). However, their sample is approximately 20% smaller than ours and stops in 2007 (whereas our study has 4 more years of recent additional data). Given that we are referring to reasonably small sample sizes, these differences in the datasets may fully explain why the modest results for additions are not confirmed by our study. Lackmann et al. (2012) also find evidence of significant positive investor reactions to additions to the DJSJ STOXX index (approximately 1.95% for the [–5, 5] event window and 4.70% for the [–10, 10] event window). Yet the difference between the results of Lackmann et al. (2012) and our study should not be surprising given that the stocks of the DJSJ STOXX are European (and listed in many different countries), and it has been documented that the US and Europe diverge in terms of the financial impact of CSR (Von Arx and Ziegler, 2013; Kolbel and Busch, 2013). Furthermore, the dataset of Lackmann et al. starts in 2001, whereas ours begins in 1990, making the dynamics of the CSR–CFP link more complex in our case.

Uniqueness of the social index effect

Our study shows that for the MSCI KLD 400, there appears to be an asymmetric social index effect, whereby deletions are connected with negative abnormal performance (a result that becomes stronger with time) and trading activity spikes around the event (a result that is not persistent in the long-run) but additions do not lead to any significant change in market prices. From the perspective of the generic index effect literature, these findings do not adhere to any of the explanations that have been given in the past. Unlike some of the conclusions drawn from part of the literature exploring the effects of S&P 500 recompositions, the social index effect appears to be informationally meaningful (as expected, given the differences in the criteria involved in the two types of indices). The persistent nature of the price effect on deletions makes us reject the price pressure conjecture. The temporary effects in trading volumes contradict the liquidity effect view. The fact that both effects are statistically robust for deleted firms but not for added firms

goes against the investor recognition framework. Lastly, the nature of social indices along with the qualitative findings coming from the comparison of firm operational performance before and after they are added to (or deleted from) the index suggest that these are not information-free events and that in this way they do not conform to the imperfect substitutes view[17].

Therefore, the framework that seems to be better fitted to explain the findings of this study is consistent with the *informational content*. However, this view in its traditional version cannot explain this asymmetry in the financial effects of addition and deletion events in social stock indices. We posit that the stylized characteristics of these effects are particularly compatible with empirical and conceptual aspects surrounding social indices, i.e. that the information content of social index recomposition is distinct.

In particular, the asymmetric impact of social index recompositions is fully aligned with a great deal of empirical work in the CSP–CFP literature (Wood and Jones, 1995; Meijer and Schuyt, 2005; Lankoski, 2009; Oikonomou et al., 2012), which suggests that corporate social responsibility and corporate social irresponsibility are not the flip sides of the same coin and that the negative financial impact of the latter is, ceteris paribus, stronger than the positive financial impact of the former. Thus, because a stock's deletion from a social index can be interpreted as a strong, highly visible signal produced by an independent institution that the firm has been involved in some kind of a social or environmental transgression, it is plausible to find that its financial effects are greater than those of additions to the index (which is a signal for the firm being a strong social performer). This social information content effect is also consistent with the results of our additional analyses, and thus we believe the relevant view to be the most compatible with our findings.

In addition, as Doh et al. (2010) note, there may be a behavioural element involved in the explanation of the differential index effect. In particular, Baumeister et al. (2001) have shown that individuals tend to react more intensely to negative rather than positive pieces of new information. Mishina et al. (2012) also argue that indications of corporate social irresponsibility are perceived

by stakeholders to be more highly diagnostic of a firm's true moral character than indications of social responsibility. In addition, it has been shown in the literature of financial economics that "losses and disadvantages have greater impact on preferences than gains and advantages" (Tversky and Kahneman, 1991, p. 1039), a type of loss aversion utility theory, which is also in line with our findings. These cognitive biases could also be used to explain, in part, why we document negative short-run abnormal returns associated with deletions and no material price changes for additions, but, admittedly, they do not explain the respective differences in long-term stock performance connected to the two types of events.

Conclusions

This study extends the extant CSP–CFP literature by providing comprehensive analyses and interesting findings on whether the financial performance of firms is affected when added to or removed from a social equity index. The nature of this investigative setting means it avoids the frequently encountered endogeneity criticism, and helps in capturing the effects of highly visible CSP-related events in the financial markets. Our investigation of not merely abnormal returns, but also trading volumes and earnings per share, both in the short-run and long-run, allows us to delve deeper in the respective part of the literature than previous studies. By carefully considering the combination of our results and contrasting them with those that are compatible with traditional views for index reconstitution effects, we can conclude that the social index effect is unique: There is a clear asymmetry in financial impacts between addition and deletion events, in the social stock index we investigate, with the latter being stronger than the former.

The inferences drawn from these analyses are of interest to a variety of different parties. There are important lessons for firm managers and corporate executives; the high visibility and legitimacy to the claim of corporate social irresponsibility that comes with the exit from a social index can be heavily penalized by the market in the medium-term, thus making it less effective for the firm to refinance itself through the equity market. The post-event deterioration in operational performance of deleted firms could also be attributed to the weakening of their strategic relationships with key stakeholders, who value corporate social responsibility. Hence, it is important that firm managers not only promote but also maintain high levels of CSP through their companies' operations and business practices. To be more specific, a firm's involvement with a controversial business sector (including activities relating to alcohol, gambling, tobacco, military weapons, firearms, nuclear power, among others) will trigger the relevant exclusionary screening criterion from the index and the resulting deletion of the firm will be seen as a highly visible, legitimate endorsement of the company becoming more irresponsible in its attitude towards key

stakeholders. The damage in the firm's reputational capital will also be reflected in an increase in the cost of equity, both in the short- and long-run. A similarly hazardous sequence of events leading to a firm's delisting from the MSCI KLD 400 social index can be initiated by other indications of declining CSP, such as: violations of employee health and safety standards, significant production of ozone-depleting chemicals, affirmative action controversies, disrespecting the sovereignty and intellectual property of indigenous peoples or regulatory actions relating to anti-trust allegations. Corporate managers should consider all of the above should they want to effectively manage the financial and operational risks that come with the resulting loss of the gold social seal.

Additionally, managers of socially responsible mutual funds, index fund and hedge fund managers, along with other investors, have a more complete perspective towards the sign, magnitude, significance and time-horizon of the price effects that accompany social index recompositions and an appreciation of how these may vary between additions and deletions. While there are no material gains to be reaped from additions to social indices, there are indications that the selling (or short-selling) of the stocks that have been deleted from the social index on the day of the event and its subsequent buy-back after three weeks leads to an average abnormal return of 1.6%, before transaction costs. More importantly, the cumulative, risk-adjusted market performance of deleted stocks is significantly negative for several months after the event, thus they constitute unattractive assets for investors who base their decisions on financial, non-financial (ethical or religious) criteria or both.

Despite our best efforts to create a more comprehensive framework concerning the social index effect, there are a number of ways in which the literature can be further expanded. First of all, the modest market capitalization of the ETFs and the absence of a derivatives market can help to explain why our study does not, for the most part, document significant short-term price pressures surrounding index recompositions, which can be attributed to the demand of these indices as

packaged products. However, assuming that the rapid growth of ETFs on social indices will continue, this is a limitation that will fade in time, thus making the social index effect worthwhile for scholars and practitioners to revisit. In addition, it would be interesting for researchers to investigate whether there is variability in the financial effects of deletions of firms from social indices according to the particular kind of controversy that led to the deletion. For example, it may be that deletions associated with environmental transgressions are more heavily penalized by the market compared to deletions connected with corporate governance issues (or vice-versa). Relatedly, the use of the MSCI KLD 400 index limits our inferences to the context of US firms. Looking at social indices that include firms from different countries would aid in identifying whether the asymmetric social index effect holds in a global framework.

Appendix

ESG criteria for the MSCI KLD 400

MSCI's ESG research framework generates an analysis and rating of each company's management of its environmental, social and governance performance. The rating criteria address a company's ESG performance in the context of five categories, covering key corporate stakeholders.

- *Environment* – rate a company's management of its environmental challenges, including its effort to reduce or offset the impacts of its products and operations.
- *Community and Society* – measure how well a company manages its impact on the communities where it operates, including its treatment of local population, its handling of human rights issues and its commitment to philanthropic activities.
- *Employees and Supply Chain* – assess a company's record of managing employees, contractors and suppliers. Issues of particular interest include labor-management relations, anti-discrimination policies and practices, employee safety, and the labor rights of workers throughout the company's supply chain.
- *Customers* – measure the quality and safety record of a company's products, its marketing practices, and any involvement in regulatory or anti-competitive controversies.
- *Governance and Ethics* – address a company's investor relations and management practices, including company sustainability reporting, board accountability and business ethics policies and practices.

MSCI applies its proprietary ESG rating framework to each company by selecting the ESG rating criteria most relevant to each firm. To evaluate a company, analysts review more than 500 data points and score more than 100 indicators. MSCI expresses a company's ESG performance as a numerical score and on a letter-based rating scale. The ratings fall on a nine-point scale from AAA to C. Scores and ratings are not normalized across individual industries or the overall company universe. This means that one industry may have no companies that receive any "A" ratings, while

another industry may have no companies with "C" ratings. In addition, the index excludes companies with significant business activities involving alcohol, tobacco, firearms, gambling, nuclear power or military weapons.

For additional information on the MSCI KLD 400 Social Index Methodology, the interested reader is directed to: www.msci.com/products/indexes/esg/methodology.html

Notes

[1] Broadly defined as a process whereby fund managers incorporate environmental, social and corporate governance considerations in the security selection process, in an effort to maximize portfolio performance while respecting the social concerns of investors.

[2] The data mentioned in this discussion are based on the 2010 Report on Socially Responsible Investing Trends in the United States, created by the US Social Investment Forum, last accessed May, 16th 2012 at ussif.org.

[3] Schröder (2007) provides the details of 29 different SRI stock indices. At the time of writing, MSCI has more than 80 different ESG (environmental, social, governance) indices while the family of Dow Jones Sustainability Indices numbers 19 members; and these are just two ESG index providers.

[4] In the United States, "twenty-six exchange traded funds (ETFs) with $4.0 billion in total assets were identified as incorporating ESG criteria. Although ETFs accounted for only 1% of the total assets of all ESG investment vehicles, their assets have grown 225% since 2007, the fastest of all registered investment vehicles"(Report on Socially Responsible Investing Trends in the United States, 2010, US Social Investment Forum, p. 9).

[5] Lackmann et al. (2012) also examine these issues, but as possible determinants of the magnitude of investor reactions to index reconstitutions and not as focal points of the empirical analysis – as is the case in this study.

[6] Assuming that they have no impact on the discounted sum of the expected future firm profits accruing to shareholders.

[7] A more detailed discussion of the various CSP metrics that have been used is provided by Margolis et al. (2009).

[8] There is also the possibility that due to leakage of information or the market's ability to forecast the decision of the committee, the effects of the reconstitution of the index are gradually incorporated to the prices of the stocks prior to the respective announcement.

[9] For further information about the index's inclusion and deletion criteria, the reader is directed to MSCI KLD 400 Social Index Methodology manual, May 2011. A brief overview of the criteria is placed in the appendix of the paper.

[10] It is worth mentioning that in its earlier days of the (then) KLD 400, exits from and entries to the index would most usually coincide, would take place outside of periodic reviews and with announcements and recompositions occurring simultaneously.

[11] Numbers taken from http://us.ishares.com/product_info/fund/overview/DSI.htm , last accessed June 25, 2012.

[12] We have checked the frequency of such events in our final deletion sample. It is very limited and does not influence the conclusions we draw. We would like to thank an anonymous referee for pointing this out.

[13] For our observation period, this criterion leads to a reduction of the overall additions sample by 0.15% and the deletions sample by 0.8%. Thus, we believe that applying this filter to remove the effect of extreme outliers does not severely influence the representativeness of the final samples we utilize for our analyses.

[14] http://www.standardandpoors.com/indices/sp-500/en/us/?indexId=spusa-500-usduf--p-us-l-- last accessed June, 5th 2012.

[15] In order to account for biases resulting from simultaneous changes in the broader earning performance of US corporates, we perform a similar analysis by examining Earnings Ratios expressed by each company's total earnings as a percentage of the concurrent total earnings of the S&P 500 index. The results are not reported here for the sake of parsimony but are qualitatively identical to those coming from unadjusted earnings.

[16] Although these numbers look small, the average scores of aggregated strengths for the entire KLD panel dataset consisting of circa 38,000 firm-year observations is 0.049 (for aggregated concerns it is 0.073). Thus the changes are of significant magnitude.

[17] The reader is directed to Table 1 for an overview of the characteristics that are compatible with each theory that tries to explain the index effect.

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Table 1: Index effect theories and their empirical characteristics

	Effect on stock prices	Effect of trading volumes
Price pressure	Temporary	Temporary
Imperfect substitutes	Permanent	Temporary
Information content	Permanent	Temporary
Liquidity effect	Permanent	Permanent
Investor recognition	Permanent for additions, temporary for deletions	Temporary
Social index effect	?	?

Table 2: Short-run abnormal return performance of stocks added to and deleted from the MSCI KLD 400 social index

	Additions sample			Deletions sample		
Day	**Abn. Ret.**	**t-statistic**	**N of firms**	**Abn. ret.**	**t-statistic**	**N of firms**
T–10	–0.10%	(–0.64)	201	0.29%	(0.85)	77
T–9	0.11%	(0.65)	201	0.40%	(1.17)	77
T–8	0.16%	(0.95)	202	–0.15%	(–0.44)	78
T–7	0.18%	(1.11)	201	–0.16%	(–0.47)	78
T–6	–0.01%	(–0.04)	202	–0.17%	(–0.50)	75
T–5	–0.17%	(–1.04)	201	0.03%	(0.08)	74
T–4	0.05%	(0.32)	202	0.29%	(0.86)	78
T–3	0.11%	(0.66)	202	0.53%	(1.55)	77
T–2	0.19%	(1.14)	202	0.09%	(0.26)	72
T–1	0.03%	(0.17)	202	–0.04%	(–0.11)	73
T	0.02%	(0.14)	200	**–0.69%**	**(–2.02)***	72
T+1	0.01%	(0.09)	202	0.11%	(0.31)	76
T+2	–0.03%	(–0.19)	202	–0.50%	(–1.46)	73
T+3	0.00%	(–0.01)	202	–0.38%	(–1.12)	75
T+4	0.09%	(0.52)	202	0.58%	(1.65)	75
T+5	0.16%	(0.95)	201	–0.16%	(–0.47)	76
T+6	–0.32%	(–1.94)	199	0.02%	(0.06)	77
T+7	–0.27%	(–1.61)	202	–0.09%	(–0.26)	74
T+8	–0.11%	(–0.67)	202	–0.30%	(–0.89)	74
T+9	–0.28%	(–1.67)	201	–0.40%	(–1.17)	73

T+10	0.18%	(1.07)	202	–0.23%	(–0.66)	73
T+11	–0.07%	(–0.45)	201	–0.08%	(–0.25)	77
T+12	–0.05%	(–0.33)	202	0.18%	(0.54)	78
T+13	0.28%	(1.70)	202	–0.12%	(–0.36)	77
T+14	–0.14%	(–0.84)	202	–0.42%	(–1.24)	77
T+15	–0.29%	(–1.74)	202	0.19%	(0.57)	77

Note: *Day* indicates each key date of the event window with event date at time T as a point of reference. *Abnormal returns* are defined as the average of the differences between raw returns and market model returns for each date of the event window. *T-statistic* is the standard t-test measuring the significance of abnormal returns during each date of the event period. with * indicating significance at 5% level. *N* represents the number of firms in the equivalent daily sample.

Table 3: Cumulative abnormal return performance of stocks added to and deleted from the MSCI KLD 400 social index

	Additions sample		Deletions sample	
Window	**CAARs**	**t-statistic**	**CAARs**	**t-statistic**
T–5 to T–1	0.21%	(0.56)	0.90%	(1.18)
T–3 to T–1	0.32%	(1.14)	0.58%	(0.98)
T–1 to T+1	0.07%	(0.23)	–0.62%	(–1.05)
T only	0.02%	(0.14)	**–0.69%**	**(–2.02)***
T+1 to T+15	–0.84%	(–1.32)	–1.61%	(–1.22)
T to T+125	–2.88%	(–1.56)	**–14.00%**	**(–3.65)*****

Note: *Window* defines the number of days taken into account with event date at time T as a point of reference. *CAAR* is the cumulative average abnormal return of the firms for the corresponding window and *t-statistic* is the standard t-test measuring the significance of the cumulative average abnormal returns for the defined period, with * indicating significance at the 5% level and *** indicating significance at the 0.1% level.

Table 4: MSCI KLD 400 additions: Cross-sectional abnormal return attribution regressions

Dep. Variable: AR on Event date			Dep. Variable: CAAR[0,+15]		Dep. Variable: CAAR[0,+125]	
N: 190			N: 192		N: 193	
Variable	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Market cap.	–0.0005	(–0.047)	0.0000	(0.716)	0.0000	(2.635)**
Book to market value	–0.0003	(–0.923)	–0.0003	(–0.471)	0.0154	(2.117)*
Return on equity	0.0037	(0.715)	–0.0014	(–0.115)	–0.1372	(–2.011)*
Leverage	–0.0006	(–0.903)	–0.0005	(–0.370)	–0.0022	(–0.237)
Dividend yield	–0.0019	(–1.581)	0.0021	(0.920)	0.0088	(0.490)
R&D intensity	–0.0092	(–0.355)	–0.0771	(–0.887)	–1.0638	(–2.651)**
Exchange	–0.0046	(–0.984)	0.0271	(2.562)*	0.1229	(2.062)*
Time effects	YES		YES		YES	
Industry effects	YES		YES		YES	
R-squared	20.83%		14.13%		24.57%	

*Denotes significance at the 5% level and **denotes significance at the 1% level. Newey-West autocorrelation and heteroskedasticity robust standard estimators are applied.

Table 5: MSCI KLD 400 deletions: Cross-sectional abnormal return attribution regressions

Dep. variable: AR on event date			Dep. variable: CAAR[0,+15]		Dep. variable: CAAR[0,+125]	
N: 72			N: 76		N: 76	
Variable	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
Market cap.	0.0000	(1.056)	0.0000	(0.295)	0.0000	(1.229)
Book to market value	0.0004	(0.358)	0.0004	(0.130)	0.0080	(0.198)
Return on equity	–0.0003	(–0.165)	–0.0036	(–0.509)	–0.0097	(–0.175)
Leverage	–0.0003	(–1.192)	0.0011	(1.285)	–0.0040	(–0.185)
Dividend yield	–0.0081	(–2.607)*	–0.0117	(–3.268)***	–0.0322	(–1.109)
R&D intensity	–0.2366	(–1.735)	0.1305	(1.499)	0.9569	(1.018)
Exchange	–0.0056	(–0.345)	0.0072	(0.359)	0.0759	(0.453)
Time effects	YES		YES		YES	
Industry effects	YES		YES		YES	
R-squared	42.46%		43.88%		35.81%	

*Denotes significance at the 5% level and ***denotes significance at the 0.1% level. Newey-West autocorrelation and heteroskedasticity robust standard estimators are applied.

Table 6: Effect of additions to and deletions from the MSCI KLD 400 index on trading volume

	Additions sample		Deletions sample	
Day	**Volume ratio**	**t- statistic**	**Volume ratio**	**t- statistic**
T–10	1.04	(0.82)	1.42	(1.58)
T–9	1.04	(0.68)	1.23	(1.07)
T–8	1.04	(0.57)	1.16	(0.92)
T–7	1.02	(0.33)	0.90	(–1.51)
T–6	1.00	(–0.02)	1.38	(1.91)
T–5	1.09	(1.10)	2.04	(1.76)
T–4	1.00	(0.09)	1.48	(1.30)
T–3	1.00	(0.06)	1.21	(1.56)
T–2	0.95	(–1.12)	**1.74**	**(2.19)***
T–1	1.05	(0.63)	2.37	(1.97)
T	1.30	(1.73)	**1.93**	**(2.48)***
T+1	1.13	(1.41)	1.68	(1.67)
T+2	1.05	(0.67)	**1.47**	**(2.14)***
T+3	1.07	(0.99)	**1.29**	**(2.13)***
T+4	**1.18**	**(2.22)***	**1.31**	**(2.49)***
T+5	1.07	(1.16)	1.20	(1.43)
T+6	1.08	(1.37)	1.00	(0.04)
T+7	1.02	(0.50)	1.05	(0.63)
T+8	1.03	(0.55)	1.10	(0.82)
T+9	1.05	(0.76)	1.53	(1.64)
T+10	1.08	(1.22)	1.39	(1.59)
T+11	1.10	(1.53)	1.62	(1.51)

T+12	1.05	(0.74)	1.19	(0.97)
T+13	1.06	(1.01)	1.15	(1.10)
T+14	1.08	(0.91)	0.95	(–0.72)
T+15	1.07	(0.68)	0.96	(–0.60)

Note: *Day* indicates each key date of the event window with event date at time T as a point of reference. *Volume Ratio* is the average volume ratio over the *base volume ratio* (estimated over 60 days before the event period) for each day of the event window. *T-statistic* is the standard t-test measuring the significance of the average volume ratios each day of the event period, with * indicating significance at 5% level.

Table 7: Pre-event and post-event earnings per share for MSCI KLD 400 index member stocks

	Additions sample		**Deletions sample**	
	EPS mean	**St. error**	**EPS mean**	**St. error**
pre-event period	1.37	(0.11)	2.20	(0.49)
post-event period	1.45	(0.12)	2.06	(0.44)
Δ(EPS)%	5.96%		–6.54%	
equality of means t-statistic	(–0.49)		(0.13)	

Note: *Pre-event* and *post-event* periods refer to one year before and one year after the event date for each firm, respectively. *EPS mean* measures the average earnings per share for each firm a year before and a year after the event (earnings are announced quarterly and are averaged over four calendar quarters). *Standard Error* of the *EPS mean* measures the standard deviation of the mean. *T-statistic* refers to the test of the equality of EPS means before and after the event.

Figure 1: Estimation and observation windows

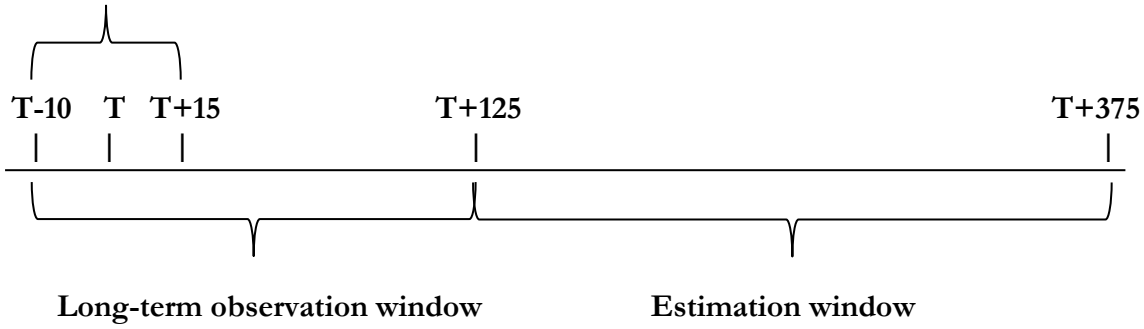

Figure 2: Long term trading volume performance after addition to the MSCI KLD 400 index

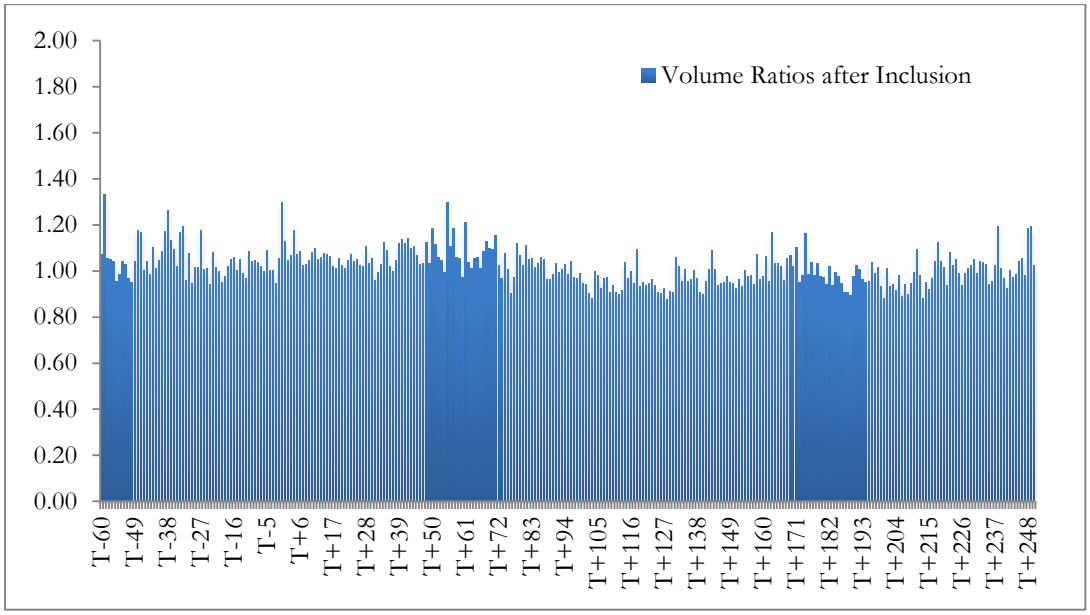

Figure 3: Long term abnormal trading volume performance after deletion from the MSCI KLD 400 index